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ABSTRACT

The Model Computerphobia Reduction Program involved assigning clients to individualized treatment programs on the basis of computer anxiety level. In order to evaluate the personalized treatment programs, pre- and post-treatment attitude scales (including the Attitudes Toward Computers Scale, the Computer Anxiety Rating Scale, and the Computer Thoughts Survey) and a post-treatment questionnaire were utilized. In addition, a follow-up questionnaire was administred 6 months after completion of the treatment program. Clients showed dramatic changes following the 5-week program. Nearly all clients showed markedly decreased anxiety, improved cognitions, and enhanced attitudes. Clients increased computer utilization on campus, in their personal lives, and on the job. (5 references) (GL)

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THE MODEL COMPUTERPHOBIA REDUCTION PROGRAM:

A Longitudinal Evaluation

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January 1989

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THE MODEL COMPUTERPHOBIA REDUCTION PROGRAM:

A Longitudinal Evaluation

Introduction

The Model Computerphobia Reduction Program was funded by the U.S. Department of Education's Fund For The Improvement of Postsecondary Education (FIPSE) from August 1985 through October 1988. The project was designed to develop and test a "Model Computerphobia Reduction Program" that would include the following components:

(1) individualized computerphobia assessment,

(2) a graduate-student internship program,

(3) personalized treatment programs and

(4) a comprehensive outreach program.

This monograph provides a longitudinal evaluation of the personalized treatment programs. The first component, computerphobia assessment, is summarized in Rosen, Sears and Weil (1987a, 1987b). The second and fourth components plus a complete description of the treatment programs are found in Weil, Rosen and Shaw (1988).

This monograph will present a brief description of the Model Computerphobia Reduction Program including a summary of data collection techniques followed by a detailed description of the sample. The third chapter will examine immediate treatment program effects while the fourth chapter will discuss long-term effects. The fifth chapter will

investigate the program dropouts and the final chapter will discuss implications of the evaluation results.

CHAPTER 1: PROJECT DESCRIPTION

Treatment Modules

The Model Computerphobia Program includes two individualized treatment or skills-acquisition modules and one group treatment that were designed for specific types of computerphobics. All programs are brief (five hours) with the individual programs meeting twice a week for five weeks and the group program meeting once a week for five weeks. The goal of the program is to allow the computerphobic student to participate in one or more programs while maintaining class attendance and performance. The program brevity allows the student to begin the program early in the semester and complete it before midterms. This should help the student maintain and improve classroom performance before a "sense of dread and failure" becomes a self-fulfilling prophecy. These programs are described in detail in Weil, Rosen and Sears (1987) and Weil, Rosen and Shaw (1988) and will be described briefly here.

The Anxious Computerphobic is one who exhibits the classic signs of an anxiety reaction including sweaty palms, heart palpitations, headaches, etc. when facing computer interaction. This person is assigned to an individualized Systematic Desensitization (SD) program. First, the client and a graduate-student intern work together to develop a personal hierarchy of scenes depicting increasing levels of

interaction with her feared object or situation. Second, the client is taught to relax completely. Finally, the client progressively pairs the newly learned relaxation response with the imagined scenes, practicing relaxing with each new scene. As the client learns to relax with progressively more uncomfortable scenes she develops the ability and desire to approach and interact with the previously feared object or situation.

The Cognitive Computerphobic is one who, on the surface, seems calm and relaxed. However, internally, this computerphobic is bombarding herself with negative messages such as "Everyone else knows how to do this but me!" or "I'm going to hit the wrong button and mess up the machine!" This type of computerphobic is assigned to an individualized Thought Stopping/Covert Assertion(TS/CA) program. Working with a graduate-student intern, the client makes a list of the internalized negative self-statements. Using thought stopping the client learns to stop these messages and leaves an internal void which was formerly occupied by the steady stream of negative cognitions. Next, using covert assertion, the client develops positive, motivating self-statements and learns to internalize them to fill the void. As the client learns to stop the negative thoughts and replace them with positive, motivating self-statements, she is able to approach a computer interaction with confidence and hope.

An Uncomfortable User is a person who may be slightly anxious or use some negative self-statements, but is generally not in need of individualized attention for these problems. Instead, this person simply lacks information about computers and support for her concerns, so she is assigned, with several other similar students, to an Information/Support (I/S) Group. This group is designed to provide specific information about computers including myths and realities about technology, future prospects for technology and actual computer parts and their functions. The group is partly structured (with specific exercises) and partly unstructured to allow room for self-disclosure, discussion, problem solving and skills acquisition. The group attempts to provide a feeling of "universality" for the Uncomfortable User by demonstrating that she is not alone in her discomfort and confusion.

Screening and Assessment

The Model Computerphobia Reduction Program has developed a two-tiered strategy for computerphobia assessment. At the beginning of each semester classes with computer interaction were targeted across the university campus. Classes in all units were considered as long as the students in the class anticipated any computer interaction. Each instructor was contacted individually and permission was granted for a graduate-student intern to administer an "In-Class Screening Packet" the first week of class. This

packet included an informed consent form, the Computer Anxiety Rating Scale (CARS) and the Computer Thoughts Survey (CTS). For further information concerning these measures see Rosen, Sears and Weil (1987a, 1987b).

Within a week the graduate-student intern returned to the class and gave each student a personalized "Computer Comfort Profile" (Weil, Rosen & Shaw, 1988). This profile sheet had two "thermometers" which were filled in with red ink to indicate the student's personal level of computer anxiety and computer cognitions. Levels were designated as no anxiety, low anxiety, moderate anxiety and high anxiety for the CARS and positive, slightly negative, moderately negative or extremely negative cognitions for the CTS. The three highest levels for each scale were indicated as "At-Risk" for computerphobia. A section labelled "Interpretation" summarized the possible manifestations of the "at-risk" scores and suggested that the person contact the program for further assistance. The intern also briefly discussed the profile form and assured the students that a large number of other students have tested in the "at-risk" range and have received help in a timely fashion.

In all, over four semesters, 1,617 students in 76 courses were given this In-Class Screening Packet and Computer Comfort Profile. Students were screened in courses across campus units including: education (21 courses; 421 students); social sciences (30 courses; 595 students);

sciences (2 courses; 36 students); management (21 courses; 541 students) and interdisciplinary studies (2 courses; 24 students). Records were kept of all assessment results including CARS and CTS scores and final course performance.

If the student contacted the program she was given several additional assessment instruments including the Attitudes Toward Computers Scale (ATCS; Rosen, Sears & Weil, 1987a, 1987b) and the Confidential Intake Form for Computerphobia Program (Weil, Rosen & Shaw, 1988). This latter form elicits demographic data including: age, ethnic background, previous counseling and therapy history, academic major and minor, and units completed. Additional self-ratings were obtained for computer knowledge, computer attitudes, computer anxiety and computer confidence plus checklists for anxiety reactions and negative cognitions. The final questions assessed computer experience in the student's personal, academic and career life.

Although this two-tiered plan of assessment provided the major source of clientele for the program some potential clients contacted the program directly. These people were invited to the program office to complete all measures. Results were communicated through the Computer Comfort Profile in a personal appointment with an intern during the following week.

Treatment Assignment

Assignment to specific treatment modules was based mainly on the pretest CARS and CTS scores as well as the self-report items on the Confidential Intake Form. Typically, if a client tested in the two highest risk categories on either the CARS (moderate anxiety or high anxiety) or CTS (moderately negative or extremely negative) she was offered an individualized treatment based on the higher "at-risk" score. High CARS scorers were offered Systematic Desensitization and high CTS scorers were offered Thought Stopping/Covert Assertion. Typically, the self-report items corroborated the general clinical pattern suggested by the assessment. If the self-report items did not match a decision was made by the Clinical Director as to the appropriate treatment and verification was made of this by the intern during the first (intake) session. If the scores on the CARS and CTS were equally high, and the self-report items did not clarify the choice, the treatment assignment was not made until after the intake interview. During this interview, the intern asked specific probe questions to determine the treatment of choice.

Each student who was offered an individual treatment was also offered the Information/Support Group program. If time constraints only permitted them to complete one treatment they were encouraged to select the individualized treatment and complete the group treatment at a later date.

Students who scored in one or both of the two lowest risk categories (nonanxious and slightly negative cognitions, slightly anxious and positive cognitions or slightly anxious and slightly negative cognitions) were offered the Information/Support Group.

Posttesting

Following the completion of the final treatment session, a separate session was scheduled for posttesting within one week. If the student was involved in two overlapping treatments (individual and group) she would receive the posttests following the final session of the final treatment program. If the student was involved in two consecutive treatments she would take a posttest after each treatment program was completed.

The posttest packet consisted of the CARS, CTS and ATCS plus a Post-Treatment Questionnaire (see Weil, Rosen & Shaw, 1988). This Post-Treatment Questionnaire included the same self-ratings as the pretest questionnaire plus additional questions that assessed a general notion of what the client gained from the program and specific examples of skill utilization in the client's personal life, academic life and job or career.

Follow-up Testing

Six months after the client completed her program, she was contacted by mail to participate in the follow-up assessment. The follow-up questionnaire packet included the

CARS, CTS and ATCS plus a Six-Month Follow-Up Questionnaire (see Weil, Rosen & Shaw, 1988). This latter instrument included the same self-ratings as the pretest and posttest questionnaires, plus additional questions that assessed computer interactions that had occurred in the previous six months, perceived program effectiveness, and skill utilization. If the client did not respond within two weeks a reminder letter was mailed. If the client still did not respond in an additional two weeks a personal phone call was placed to the client or to a reference person listed on the pretest questionnaire. If necessary, an additional packet was mailed.

CHAPTER 2: DESCRIPTION OF SAMPLE

Client Recruitment

Two hundred four potential clients approached the Computerphobia Reduction Program. Table 1 details the disposition of these potential clients. All 204 were administered pre-treatment intake data and were offered the opportunity to receive appropriate treatment. Forty-two (20%) did not start treatment. A variety of reasons were given by these "Nonstarters" including, they did not have time, they were no longer interested, and they were dropping the class which they associated with the CRP program. Others never responded to calls from the program interns inviting them to participate in the program.

One hundred sixty-two (79%) of the initial 204 potential clients did start one or more forms of treatment. However, 13 (8%) of them dropped out of the program after beginning treatment. Their reasons for dropping included: a change of class or work schedule, inability to practice Thought Stopping or Systematic Desensitization techniques at home, and a decision they no longer needed the extra class credit they would have received for participating. Some students never responded to calls from the program interns attempting to schedule further sessions.

Thus, of the original 204 potential clients, 149 (73%) completed one or more treatment program. Seventeen (11%)

clients received more than one treatment: 10 received Thought Stopping/Covert Assertion plus the Information/Support Group, and 7 received Systematic Desensitization plus the I/S Group. Nine clients who initially started two treatments dropped one of them: 5 dropped the group segment and continued with individual sessions; 4 dropped the individual sessions and continued with the group component. The final 149 clients received a total of 166 treatments.

Table 1

Final Disposition and/or Treatment Received of Potential Clients Approaching the Computerphobia Reduction Program.

Disposition/Treatment of Sample	Number	Percent
TOTAL APPROACHING PROGRAM	204	100%
Did not start treatment	42	21%
Started treatment	162	79%
TOTAL BEGINNING TREATMENT	162	100%
Dropped after start treatment	13	8%
Completed one/more treatments	149	92%
TOTAL TREATED CLIENTS	149	100%
Thought Stopping/Covert Assert	41	25%
Systematic Desensitization	15	9%
Information/Support Group	76	46%
TS plus I/S Group	10	6%
SD plus I/S Group	7	4%
TOTAL TREATMENTS ADMINISTERED	166	100%
Thought Stopping/Covert Assert	51	31%
Systematic Desensitization	22	13%
Information/Support Group	93	56%

Clients were recruited in a variety of ways. Several offices on campus which give direct services to students were oriented to the program and requested to refer appropriate students. These included the Learning Assistance Center, the Counseling Center and the Student Development Office. Early in the program an article about the program appeared in the student newspaper inviting students to come in for treatment. Flyers were distributed and/or posted at several locations on campus including the University Library which uses an on-line catalog, as well as a variety of computerized information services. Posters and flyers inviting library users who experienced discomfort or frustration using these machines to come to the CRP offices were strategically placed and also given to reference librarians. Similar posters were placed in all student computer labs on campus. Interns also had an information table available at student registration to explain the program to interested students and invite them to participate in the program. Individual instructors who indicated they would be using computers in their classes were given an orientation to the program and invited to refer students in need of treatment. Additionally, permission was requested of instructors who both used and did not use computers in their classes to do in-class pretesting of their students.

These recruitment approaches were differentially successful. Potential clients who approached the program for treatment were asked how they heard about the program. Table 2 below indicates that the dominant source of referrals was instructors. The next most effective approach was the flyers and posters posted near locations on campus where students would be using computers. Responses coded as "Other" included: walking by the CRP and coming in out of curiosity, talking to interns at registration, and being recommended by a supervisor. The other approaches did not yield many clients.

Demographic Characteristics

A total of 149 clients received some form of treatment from the Computerphobia Reduction Program. As seen in Table 3, over two-thirds were female and one-third were male. There was a wide age range among the clients. The youngest to receive treatment was 16 years old, the oldest 62. Several ethnic groups participated in the program. Blacks and Whites participated in the greatest numbers, 33% and 28% respectively. Asians and Hispanics participated in lower numbers, 18% and 15%, respectively.

Of the 149 clients, only one-fifth had previously received some form of therapy.

Table 2

Number of Potential Clients Yielded by Various Recruitment Approaches.

Recruitment Approaches	Number	Percent of Responses
Instructor/in-class pretesting	117	68%
Other student	3	2%
Newspaper Article	6	4%
Flyers/posters	20	12%
Learning Assistance Center	4	2%
Counseling Center	0	0%
Student Development Office	0	0%
Other	21	12%

Table 3

Gender, Age, Ethnicity and Prior Therapy of Clients.

Demographic Characteristic	Number	Percent of Sample
GENDER:		
Male	46	31%
Female	103	69%
AGE:		
Under 18	4	3%
18-22	54	36%
23-30	42	28%
31-40	21	14%
41-50	25	17%
Over 50	3	2%
ETHNICITY:		
Asian	27	18%
Black	49	33%
Hispanic	22	15%
White	41	28%
Other or Blank	10	7%
PRIOR THERAPY:		
Yes	30	20%
No	119	80%

The program drew its clients from academic disciplines across the campus. As seen in Table 4, the School of Management contributed the largest number, nearly half (44%), which was over double the number coming from the next highest contributor, The School of Social and Behavioral Sciences (22%). The Center for Quality Education was represented by 17 clients. The School of Humanities and Fine Arts, the School of Science, Mathematics and Technology and Special Programs contributed 6, 8, and 8 respectively. The unequal numbers may be a reflection of the amount and importance of computer usage in the schools. Alternatively, it may be an artifact of recruiting methods.

Seniors far outnumbered other class levels among the clients, with nearly a third of all clients compared to smaller numbers of juniors, sophomores, and freshmen. Four graduate students came for treatment.

Table 4

Academic Discipline and Academic Level of Clients.

Demographic Characteristic	Number	Percent of Sample
ACADEMIC DISCIPLINE:		
Management	66	44%
Social and Behavioral Sciences	32	22%
Center for Quality Education	17	11%
Science, Mathematics & Technology	8	5%
Special Programs	8	5%
Humanities and Fine Arts	6	4%
Blank	12	8%
ACADEMIC LEVEL:		
Freshman	11	7%
Sophomore	21	14%
Junior	20	13%
Senior	45	30%
Graduate Student	4	3%
Other or Missing	48	32%

Assignment to Treatments

As a result of the initial intake evaluations, clients were assigned to one of three treatments: Thought Stopping/Covert Assertion, Systematic Desensitization, or Information/Support Group. Of the 149 clients who received some form of treatment, well over half were assessed to be phobic enough to need individual treatment to overcome their resistance to using computers.

When initial treatment recommendations were made, any client who was assessed as needing individual treatment was also offered the Information/Support Group. However, it was made clear to these clients that if they could not manage both, the individual treatment should receive priority. Table 5, which compares treatment recommendations with actual treatments received indicates that clients generally followed that advice. Of the 54 clients who were recommended to participate in both Thought Stopping/Covert Assertion and I/S Group, 41 (76%) chose to attend only the individual sessions. Ten (18%) were able to follow the original treatment recommendation. The remaining three clients chose to forgo individual treatment and only attend group sessions.

Twenty-nine clients were offered Systematic Desensitization and I/S Group. However, only 7 (24%) participated in both. Fifteen (52%) chose the individual

sessions only. The remaining seven (24%) only participated in the Information/Support Group sessions.

The number of clients who received an individual treatment (Thought Stopping/Covert Assertion or Systematic Desensitization) steadily increased from the first term the program was offered (Winter 1986; N=3) through the last term (Spring 1988; N=25; see Table 6).

In contrast, the number of students who participated in the Information/Support Group peaked in Fall 1986 (N=37), then dropped and remained relatively steady (Spring 1987; N=14, Fall 1987; N=14, Spring 1988; N=17).

Clients who received individual treatment had an average of 7.87 sessions, with the number ranging from 2 to 14. The modal number of sessions was 7.00. Eighty-two of the 94 clients (87%) who participated in the Information/Support Groups attended five sessions. Four attended as few as 1, and one as many as 6.

Table 5

Comparison of Treatment Recommendations and Actual Treatment Received.

Treatment Type	Number Recommended	Percent of Sample	Number Received	Percent of Sample
Information/Support Grp	63	42%	76	51%
TS/CA plus I/S Group	54	36%	10	7%
SD plus I/S Group	29	20%	7	5%
TS/CA	0	0%	41	28%
SD	0	0%	15	10%
TS/CA + SD + I/S Group	2	1%	0	0%

Note. TS/CA=Thought Stopping/Covert Assertion;
SD=Systematic Desensitization;
I/S Group=Information/Support Group

Table 6

Assignments to Individual Treatment and I/S Group Across Academic Terms.

Academic Term	Individual Treatment	Information/ Support Group
Winter 1986	3 (2%)	NA
Spring 1986	9 (6%)	7 (5%)
Fall 1986	15 (10%)	37 (25%)
Spring 1987	12 (8%)	14 (9%)
Fall 1987	13 (9%)	14 (9%)
Spring 1988	25 (17%)	17 (11%)

Self-Assessment Variables

Table 7 displays the self-ratings made by all 149 clients on the pretest questionnaire. When asked to rate their current level of knowledge about computers, well over half rated themselves as having lower or much lower knowledge than average. Only 5% rated themselves as having high knowledge and none assessed their level of knowledge as much higher than average.

In contrast to what might be expected from a computerphobic group, well over half of the clients rated themselves as having neutral, positive or very positive attitudes about computers. This may be an important factor for self-selecting into a computerphobia reduction program. Those people who have fairly positive attitudes about computers, but believe they are low in knowledge or high in anxiety may be more likely to present themselves for treatment.

Nearly three-fourths of the 149 clients rated themselves as having moderate, high or very high anxiety when using computers. This is probably related to the low confidence rating subjects assigned themselves. One hundred nineteen (80%) of the clients felt they had moderate, low or very low confidence when using computers.

Table 7

Client's Self-Rated Current Knowledge, Attitude, Anxiety and Confidence About Computers.

Self Rating	Number	Percent of Sample
SELF-RATED KNOWLEDGE:		
Much lower than average	28	19%
Lower than average	54	36%
Average	59	40%
Higher than average	8	5%
Much higher than average	0	0%
SELF-RATED ATTITUDE:		
Very Negative	10	7%
Negative	36	24%
Neutral	53	36%
Positive	42	28%
Very Positive	8	5%
SELF-RATED ANXIETY:		
Very Low	12	8%
Low	31	21%
Moderate	54	36%
High	38	26%
Very High	14	9%
SELF-RATED CONFIDENCE:[a]		
Very Low	16	11%
Low	51	36%
Moderate	52	37%
High	16	11%
Very High	5	4%

[a] This measure was introduced after the first nine clients

Clients were asked to describe the anxiety reactions they experienced when using a computer or thinking about using one. This information was used to help decide which type of treatment they should receive. As seen in Table 8, the most commonly reported anxiety reactions were "restlessness" (40%) and "mind goes blank or wanders" (37%). Two more direct anxiety reactions were reported with some frequency also: "sweaty palms" (N=30; 20%) and "heart races" (N=25; 17%). Clearly these clients were experiencing classic symptoms of anxiety.

Clients were also asked to report the thoughts they had when using a computer. Table 8 shows that the three most frequently reported thoughts contribute to the picture of people who have little confidence in themselves when involved in this activity: "I'm scared I'll make a mistake and won't be able to fix it" (N=77; 52%), "Everyone else knows what they're doing" (N=75; 50%), "I feel totally confused" (N=57; 38%). Other reported thoughts continue a theme of negative self-feedback and thoughts of escape: "I'll never be able to do this" (N=49; 33%), "How can I get out of this?" (N=41; 28%), "I feel overwhelmed" (N=38; 26%), "I feel stupid" (N=37; 25%). Dysfunctional thoughts about the computer itself did not appear to play as major a role: "Computers are cold and impersonal" (N=27; 18%).

Table 8

Anxiety Reactions and Thoughts Reported by Clients When Using or Thinking About Using a Computer.

Signs of Distress	Number	Percent of Sample
ANXIETY REACTIONS:		
Sweaty Palms	30	20%
Queasy Stomach	16	11%
Restlessness	59	40%
Heart Races	25	17%
Mind Blank/Wanders	55	37%
Shortness of Breath	7	5%
Light Headedness	7	5%
Other	35	24%
None of the Above	37	25%
NEGATIVE COGNITIONS:		
Computers are cold and impersonal	27	18%
I feel stupid	37	25%
I'll never be able to do this	49	33%
Scared I'll make a mistake	77	52%
I feel overwhelmed	38	26%
How can I get out of this?	41	28%
Everyone else knows what they're doing	75	50%
I am totally confused	57	38%
Other	18	12%

Experience With Computers

General Computer Experiences. Clients were asked to report the frequency with which they had used computers in nine different categories. These categories included personal financial transactions (automatic teller machines), academically related uses (class requirement, homework assignment, in the University Library), and computer applications (word processing, in their job, programming languages, video arcade games, computer games). As might be expected for a group of people who are uncomfortable using computers, the uses which do not require a conscious recognition of the fact that a computer is being used had the highest frequency of reported use. For example, automatic teller machines require the user to do little more than be able to read and follow direction to use them successfully. According to Table 9 they had the highest number of frequent users (63%) and near the lowest number of non-users (26%). Two other relatively passive uses of computers were reported with some frequency--video arcade games (36%) and computer games (30%). Another category that was reported as having a high number of frequent users (at least higher than might be expected) was "as a class requirement" (34%). This likely reflects a no-choice situation for those clients, and may have contributed to the amount of computerphobia they experienced.

Some of the categories which require active use of a computer and where the clients were able to exercise some choice about involvement reflected higher numbers of non-users: word processing (49%), as a homework assignment (36%), learn a programming language (44%), in your job (56%), in the library (40%).

Table 9

Reported Types and Frequency of General Computer Experiences.

Type of Computer Exp	Never N	Never %	1-2 times N	1-2 times %	3-5 times N	3-5 times %	6+times N	6+times %
ATM	38	26%	9	6%	5	3%	94	63%
Word Process	73	49%	20	13%	18	12%	30	20%
Class Require	28	19%	41	28%	22	15%	51	34%
Homewk Assgn	54	36%	31	21%	24	16%	34	23%
Lrn Prog Lang	66	44%	44	30%	12	8%	22	15%
In Job	84	56%	16	11%	5	3%	35	24%
In Library	59	40%	37	25%	28	19%	22	15%
Video Games	44	30%	23	15%	27	18%	53	36%
Computer Games	48	32%	32	22%	22	15%	45	30%

Campus Computer Facilities. There are several computer facilities located on the campus. They are open for student use at times and reserved for class use at times. However, these facilities were not well-known to this group. The facility of which clients were most aware was the Student Computer Lab where students use terminals to communicate with the mainframe computer. Until recently, this was the facility most often used in class requirements and assignments. As seen in Table 10, over half of the clients were aware of the terminals. The Apple Lab, also frequently used in both lower division required and elective courses and by the Center for Quality Education for teacher preparation courses, was next on the list (41%). However, the other facilities--Commodore Lab, IBM-PC Lab, and the online catalog in the library were not well known at all. Eighteen (12%) of the clients said they had no idea any the facilities existed.

Computer Ownership. Only 34 (23%) of the 149 clients reported owning an computer. Of the 115 who did not own a computer 77 (52%) said they planned to buy one, but one fifth said they had no plans to buy one (see Table 10).

Table 10

Clients Reported Experiences with Computers on Campus and at Home.

Computer Experience	Number	Percent of System
CAMPUS:		
Main Frame Terminals	79	53%
Apple Lab	61	41%
Commodore Lab	21	14%
IBM-PC Lab	4	3%
Library	1	1%
Didn't know existed	18	12%
HOME USE:		
Yes	34	23%
No	115	77%
Plan to Buy	77	67%
Not plan to Buy	31	27%
Maybe plan to Buy	6	5%
No answer	1	1%

What clients hoped to gain from the program

Client were asked, in an open-ended format on the Confidential Intake Form, to describe what they hoped to gain from the program. Table 11 details their responses. As might be expected from the self-assessments discussed earlier, clients hoped to eliminate their self-perceived deficiencies by participation in the program. Nearly one-half of the clients said that they wanted to gain confidence, while slightly more than one-third gave gaining more knowledge as a reason for participating in the program, and slightly less than a third hoped to reduce their anxiety. A few clients even stated that they were hoping to be able to use the computer in other than school applications.

Table 11

What Clients Hope to Gain from Program.

Response	Number	Percentage
Confidence	64	43%
Knowledge of computers	53	36%
Less Anxiety	44	30%
Non-school uses	23	15%
No Fear	15	10%
Class req/extra credit	13	9%
Self-understanding	9	6%
Not sure/blank	5	3%

Demographic Differences on Pretest Variables

Client intake data were analyzed to determine if there were pre-existing demographic differences on the objective and self-assessment variables measured prior to the beginning of treatment. Six demographic variables (gender, age, ethnicity, prior therapy, academic level, and academic major) were treated as independent variables to determine their effect on the following dependent variables: total CARS score, total ATCS score, total CTS score, self-rated knowledge about computers, self-rated attitudes about computers, self-rated anxiety about computers, confidence when using computers, anxiety reactions experienced, negative thoughts when using a computer, general computer uses, and campus computer uses. The results of these analyses are displayed in Table 12 and discussed below.

Gender. There were no significant gender differences on any of the dependent variables listed above.

Age. Age was significantly correlated with several variables. The only positive correlation was with total CARS score, indicating that older clients had more computer anxiety and younger clients had less computer anxiety. The variables which were negatively correlated with age were: knowledge about computers, uses of computers, and campus computer uses. Taken together these correlations indicate that older clients had less knowledge of computers, used

computers less and were less likely to have used computers on campus.

Ethnicity. No ethnic differences were found on any of the dependent variables.

Prior Therapy. Participation in prior therapy proved to be a significant distinguishing variable on several measures. Clients who had previously been in therapy had higher computer anxiety, more negative cognitions, less knowledge about computers, a less positive attitude about computers, more anxiety reactions, and fewer computer uses.

Academic Level. Academic level made a difference only on reported anxiety reactions. Sophomore clients reported more physical discomfort than graduate students, freshmen, and seniors. Juniors had significantly fewer anxiety reactions than freshmen.

Academic Major. Academic major, logically, was significantly related to the number of computers used on campus. Clients in the School of Management used more computers than those in the School of Education and the School of Social and Behavioral Sciences. Clients in the School of Science, Mathematics and Technology (who had the highest mean usage) were significantly different from the School of Education.

Table 12

Analyses of Initial Demographic Differences on Computerphobia Scales, Self-Rating Scales, Checklists and Computer Experiences.

Measure	Gender	Age	Ethnicity	Prior Therapy	Acad Level	Acad Major
COMPUTERPHOBIA SCALES:						
CARS	t= .39	r= .15*	F= .59	t= 2.68**	F=2.26	F=1.76
ATCS	t=-.71	r=-.10	F= .21	t=-1.05	F= .35	F=2.09
CTS	t=-.31	r=-.10	F=1.12	t=-3.05***	F= .97	F=1.14
SELF-RATING SCALES:						
Knowledge	t= .74	r=-.28***	F= .44	t=-2.30*	F= .97	F= .71
Attitude	t= .24	r= .03	F=2.52	t=-2.96**	F= .64	F= .95
Anxiety	t=1.09	r= .03	F= .26	t= 1.71	F= .67	F=1.14
Confidence	t=-.77	r=-.09	F=2.40	t=-1.92	F= .70	F= .52
CHECKLISTS:						
Anx Reaction	t=-.60	r=-.03	F=2.67	t= 2.35*	F=4.55**	F= .15
Neg. Cognit	t=-1.4	r= .00	F=2.26	t= 1.69	F=2.20	F= .82
COMPUTER EXPERIENCES:						
Gen Comp Exp	t=-.49	r=-.22**	F=1.17	t=-2.23*	F=1.70	F= .77
Campus Comp	t= .75	r=-.21**	F= .19	t=-1.07	F=1.62	F=3.49**

* p<.05 ** p<.01 *** p<.001

Initial Treatment Group Differences

Clients were assigned to a treatment based on the intake measures, which included computerphobia scales (CARS, ATCS, CTS) and self-report measures (knowledge, attitude, anxiety, confidence), and checklists (anxiety reactions, negative thoughts). Evaluation of these measures led to the following treatment recommendations: Thought Stopping/Covert Assertion plus I/S Group, Systematic Desensitization plus I/S Group, or Information/Support Group Only. However, because some clients were not inclined to participate in both an individual treatment and a group, or because of scheduling conflicts, five separate categories of clients emerged: those who received only an individual treatment (Thought Stopping/Covert Assertion or Systematic Desensitization), those who received an individual treatment plus participated in the Information/Support Group (Thought Stopping/Covert Assertion plus I/S Group or Systematic Desensitization plus I/S Group) and those who participated in the Information/Support Group Only.

Similarities and differences between these five groups were examined before treatment began. Demographic, objective and self-report variables were analyzed and are reported in Tables 13 and 14.

Demographic Variables. Table 13 shows that on the majority of demographic variables there were no significant differences between the treatment groups (gender, academic

standing, academic major and age). Only on ethnicity and prior therapy were there significant pre-treatment differences. A Chi-Square test indicated that Hispanic clients were distributed differently among the treatment groups. Although other ethnic groups had the highest concentration of clients in I/S Group Only treatment, Hispanics were more evenly distributed among the five treatment types. A little over 50% received treatment for negative cognitions; 32% received Thought Stopping/Covert Assertion, 23% received Thought Stopping/Covert Assertion plus I/S Group. Lower numbers of Hispanic clients received Systematic Desensitization treatments--14% Systematic Desensitization and 4% Systematic Desensitization and I/S Group.

On the "Prior Therapy" variable, those clients who were assigned to receive individual treatment were more likely to have received some form of therapy in the past.

Table 13

Pre-treatment Demographic Differences Between Treatment Groups.

Demographic Characteristic	Treatment Group TS (N=41)	SD (N=15)	TS+G (N=10)	SD+G (N=7)	Group (N=76)	Stat. Test
GENDER:						
Male	24%	33%	40%	29%	33%	X^2 =1.40
Female	76%	67%	60%	71%	67%	
ETHNICITY:						
Asian	13%	31%	0%	17%	23%	
Black	38%	23%	12%	50%	37%	
Hispanic	18%	23%	62%	17%	8%	X^2 =21.06*
White	31%	23%	25%	17%	32%	
PRIOR THERAPY:						
Yes	29%	40%	10%	29%	12%	X^2 = 9.79*
ACADEMIC STANDING:						
Freshmen	24%	0%	0%	0%	9%	
Sophomores	5%	27%	0%	20%	21%	
Juniors	16%	27%	25%	44%	18%	
Seniors	36%	46%	75%	40%	46%	X^2 =11.46
Grad Students	4%	0%	0%	0%	5%	
ACADEMIC MAJOR:						
Soc Science	33%	36%	0%	29%	18%	
Humanities	5%	0%	11%	0%	4%	
Science-Math	0%	14%	11%	14%	6%	
Management	46%	36%	22%	43%	56%	
Education	13%	0%	33%	14%	12%	X^2 =27.67
Other	3%	14%	22%	0%	4%	
AGE (Mean)	28.9	33.3	31.4	32.0	26.9	F = 1.68

* $p<.05$

Note. TS=Thought Stopping/Covert Assertion (TS/CA);
SD=Systematic Desensitization;
TS+G=TS/CA plus Information/Support Group;
SD+G=SD plus Information/Support Group;
Group= Information/Support Group.

Computerphobia Scales. There were significant pre-treatment differences on all of the computerphobia scales administered (CARS, ATCS, and CTS) as seen in Table 14. On the CARS, which measures anxiety, clients receiving I/S Group Only had significantly lower anxiety levels than those receiving individual treatments. Clients receiving Thought Stopping/Covert Assertion had intermediate levels of anxiety which were significantly different from the I/S Group Only and Systematic Desensitization clients. As might be expected, Systematic Desensitization clients had significantly higher levels of anxiety than other treatment types.

The ATCS scores indicated that clients receiving Thought Stopping/Covert Assertion treatments had the most negative attitudes, but significant differences existed only between the Thought Stopping/Covert Assertion treatments and I/S Group Only.

As might be expected, I/S Group Only had the most positive computer thoughts as measured by the CTS. Their scores were significantly different from all other treatment categories. The Systematic Desensitization clients were significantly different (more positive) from both Thought Stopping/Covert Assertion treatments.

Self-Report Scales and Checklists. Self-rated knowledge scores revealed significant differences between I/S Group Only and all of the individual treatments except

Systematic Desensitization (I/S Group Only clients rated themselves significantly more knowledgeable).

Self-rated attitude scores indicated significantly different pre-treatment scores between I/S Group Only and all individual treatments. Systematic Desensitization clients rated themselves as having significantly more positive attitudes than Thought Stopping/Covert Assertion plus I/S Group.

On self-rated anxiety, confidence and anxiety reactions, I/S Group Only clients rated themselves significantly more positively that any of the individual treatments, which were not significantly different from each other.

On self-reported negative thoughts, I/S Group Only and Systematic Desensitization clients reported significantly fewer than Thought Stopping/Covert Assertion and Systematic Desensitization plus I/S Group. I/S Group Only was also significantly different from Thought Stopping/Covert Assertion plus I/S Group.

Computer Experiences. Statistical analyses revealed no significant group differences on General Computer Experiences and Campus Computers Experiences.

Table 14

Pre-treatment Differences Between Treatment Groups on Objective Measures, Subjective Measures, Checklists and Computer Experiences.

Measure	Treatment Groups TS	SD	TS+G	SD+G	Group	F-test
COMPUTERPHOBIA SCALES:						
CARS	122.07	156.73	128.30	162.29	99.54	13.04***
ATCS	79.80	82.67	78.00	81.14	84.30	2.54*
CTS	78.87	92.07	77.60	84.57	108.63	32.13***
SELF-RATING SCALES:						
Knowledge	2.07	2.20	1.90	1.86	2.57	4.06**
Attitude	2.51	2.93	2.10	2.43	3.47	11.89***
Confidence	2.28	2.23	1.63	2.17	2.97	8.15***
CHECKLISTS:						
Anxiety Reactions	1.88	1.73	1.80	2.14	0.83	6.89***
Neg. Cognitions	4.15	2.69	3.75	4.83	1.90	10.97***
COMPUTER EXPERIENCES:						
Gen Computer Exp	2.18	2.29	2.10	1.87	2.40	1.75
Campus Comp Exps	1.93	1.27	.80	1.43	1.19	1.27

* $p<.05$

Note. TS=Thought Stopping/Covert Assertion (TS/CA);
SD=Systematic Desensitization;
TS+G=TS/CA plus Information/Support Group;
SD+G=SD plus Information/Support Group;
Group= Information/Support Group.

CHAPTER 3: IMMEDIATE PROGRAM EFFECTS

This section will describe pretest-to-posttest program effects for those students who completed their program. Results will first be treated by a globally, looking at changes in "at-risk" category. Next, changes in individual measures will be examined followed by an analysis of the open-ended items on the posttest questionnaire. Fourth, between-group program effects will be investigated. Fifth, the two individualized treatment programs will be compared to determine the effects of each program plus the combined effect of the individual program taken in conjunction with the group program. Sixth, potential correlates will be examined including demographics and attendance. Seventh, the in-class screening data will be examined to determine program effects on course performance. Finally, a comparison study will be described that will allow comparison of the present results with non-treatment changes on some of the measures.

Global Changes

Each of the 149 clients who completed at least one treatment program could be classified as being "at-risk" for computerphobia on each of the three measurement instruments (CARS, CTS, ATCS). As a global measure, a client was labelled "at-risk" for computerphobia if she was "at-risk" on any one of the measures. Table 15 indicates the changes

made by clients from pretest to posttest in this global assessment. This table illustrates several important features of the sample. First, 30% of the sample (N=46) started their program without being tested "at-risk". These students were all I/S Group Only clients who selected the program for reasons other than their tested level of computerphobia. Second, of the 104 clients who were "at-risk" when they began their program, 84 (81%) were no longer "at-risk" at the end of their program. Of the 20 (19%) who were still "at-risk" at the end of the program, 85% showed improvement in their risk category, but not enough improvement to remove them from gbeing "at-risk". Finally, only 3 clients (2%) actually appeared more "at-risk" at the end of the program than the beginning.

Table 15

Comparison of Pretest and Posttest Global Assessments of "At-Risk" Category.

Pretest Global Assessment	Posttest Global Assessment	
	Not At-Risk	At-Risk
Not At-Risk	42 (28%)	3 (2%)
At-Risk	84 (56%)	20 (13%)

Computerphobia Measure Changes

In all, 12 measures were given both before and after the program. These included the three computerphobia instruments (CARS, CTS, ATCS), four self-ratings (knowledge, attitude, anxiety and confidence), two checklists (anxiety reactions and computer cognitions), one experience assessment for personal, academic and career/job utilization of computers, one experience assessment for actual campus computer use and personal computer ownership.

The computerphobia instruments were scored as directed in Rosen, Sears and Weil (1987) with higher CARS scores indicated more computer anxiety, higher CTS and ATCS scores indicating more positive computer cognitions and more positive computer attitudes, respectively. The self-ratings were each on a five-point scale with higher scores indicating more computer knowledge, more positive computer attitudes, higher computer anxiety and more computer confidence.

For preliminary analyses, each checklist was summed to form two composite scores. Positive responses to the seven anxiety reactions (sweaty palms, queasy stomach, restlessness, heart races, mind goes blank or wanders, shortness of breath and light headedness) were summed to form a single Anxiety Reactions score ranging from zero (none checked) to seven (all checked). Positive responses to the eight computer cognitions ("Computers are cold and

impersonal", "I feel stupid", "I'll never be able to do this", "I'm scared that I'll make a mistake and won't be able to fix it", "I feel overwhelmed", "How can I get out of this?", "Everyone else knows what they're doing", and "I am totally confused") were tallied to form a single Negative Thoughts score ranging from zero (none checked) to eight (all checked).

For preliminary analyses, the nine computer uses questions (automatic teller machine, word processing, class requirement, homework assignment, learn programming language, in your job, in the library, play video arcade games and play computer games) were averaged with the response to each item scaled as 0=never, 1=1-2 times, 2=3-5 times and 4=6 or more times. This yielded a total General Computer Experiences score ranging from 0 to 4 with higher scores indicating more computer utilization.

The questions concerning actual computer use on campus were also summed. Five potential computer uses existed on the campus including computer mainframe terminals, Apple computers, Commodore computers, IBM-PC computers and library computers for searching the catalog and/or databases. As a preliminary analysis tool, the number of Campus Computer Experiences was totalled yielding a score ranging from zero (none used) to five (all used). The final question, concerning personal computer ownership, was a simple Yes or No response with an additional question asking the client if

she planned to purchase a computer within the next five years.

Table 16 displays the pretest and posttest scores for all measures, including appropriate statistical tests. As can be readily seen, all measures showed strong, statistically significant changes in the predicted direction. The three computerphobia scales indicated large average changes from "at-risk" areas to no risk areas indicating substantial posttest reduction in computer anxiety and improvement in positive cognitions and positive attitudes. The self-rating scales indicated changes from lower than average to average knowledge, from neutral attitudes to positive attitudes, from moderate anxiety to low anxiety and from low-to-moderate confidence to moderate-to-high confidence.

The checklist responses indicated a change from nearly one and a half Anxiety Reactions to less than one-half reaction while the Negative Cognitions score showed a change from nearly three negative cognition to less than one-half negative cognition per client. The General Computer Experiences scale showed an increased use of computers from 1-2 times to nearly 3-5 times while Campus Computer Experiences increased slightly from an average of one computer used to an average of 1.25 indicating that on the average one in four clients used an additional campus computer during the five weeks between pre- and posttest.

As expected, there was no significant increase in the percentage of clients who owned computers. However, when asked if they planned to purchase a computer in the next five years 69% of the clients said "yes" on the pretest compared to nearly all clients (91%) on the posttest (Chi Square = 21.63, $p<.001$).

Table 16

Pretest and Posttest Scores and Statistical Tests for Computerphobia Measures.

Computerphobia Measure	Pretest Score	Posttest Score	Significance Test
COMPUTERPHOBIA SCALES:			
CARS	116.38	77.03	t = -12.12 ***
CTS	95.76	117.11	t = 13.33 ***
ATCS	82.33	91.82	t = 13.35 ***
SELF-RATINGS:			
Knowledge	2.29	3.14	t = 10.08 ***
Attitude	3.01	4.17	t = 14.01 ***
Anxiety	3.08	2.05	t = -8.55 ***
Confidence	2.58	3.74	t = 10.93 ***
CHECKLISTS:			
Anxiety Reactions	1.35	.30	t = -9.12 ***
Negative Cognitions	2.93	.48	t = -12.52 ***
COMPUTER EXPERIENCES:			
General Comp Exps	2.25	2.71	t = 10.18 ***
Campus Computer Exp	1.06	1.25	t = 2.69 **
Computer Ownership	24%	26%	z = 0.35

** p<.01

*** p<.001

To provide more detail, individual items were examined for the General Computer Experiences questions. When treated as an four-point scale, each use showed a significant increase in computer use as shown in Table 17. Table 18 displays the percentage of clients who increased their usage from "Never" to at least one time and the percentage of clients who increased their use from infrequent ("1-2 times") to more frequent (3+ times). Two points are clear from the first two columns of numbers. First, many clients had indicated having never used certain computer applications. About one-fifth of the sample (28 out of the 149 total clients) never used a computer for a class requirement with another quarter (39 out of 149) having used it infrequently. Strikingly, 21% (32 out of 149) of the sample had never used an automatic teller machine. Around one-third of the clients had not played games nor used the computers in the library or used a computer for homework. Finally, nearly half of the clients had not used computers on their job or for word processing or learned programming language. Second, in each area, nearly half the clients attempted to use the computer at least once during the program. Additionally, many of the clients who had previously used computers infrequently (1-2 times) used them more often during the program.

Table 17

Average General Computer Experience Change From Pretest to Posttest.

General Computer Experience Item	Pretest Score	Posttest Score	t-score
Automatic Teller	3.10	3.31	t = 2.98 **
Word Processing	2.03	2.43	t = 4.12 ***
Class Requirement	2.60	3.26	t = 6.91 ***
Homework Assignment	2.22	2.90	t = 6.25 ***
Learn Prog Lang	1.88	2.30	t = 4.42 ***
In Job	1.90	2.30	t = 4.02 ***
In Library	2.10	2.60	t = 5.88 ***
Arcade Games	2.59	2.96	t = 4.29 ***
Computer Games	2.42	2.94	t = 5.82 ***

** $p<.01$

*** $p<.001$

Table 18

Number of Clients Who Increased General Computer Use From "Never" to "1 or more times" and from "1-2 times to "3 or more times".

General Computer Experience Item	Never to 1+ times N	N(%)	1-2 times to 3+ times N	N(%)
Automatic Teller	32	13(41%)	9	3(33%)
Word Processing	66	30(46%)	17	9(51%)
Class Requirement	28	18(64%)	39	28(72%)
Homework Assignment	53	29(55%)	25	19(76%)
Learn Prog Lang	64	29(45%)	38	14(37%)
In Job	75	21(28%)	14	6(43%)
In Library	54	26(48%)	32	17(53%)
Arcade Games	40	18(45%)	23	9(39%)
Computer Games	43	24(56%)	31	21(68%)

The Campus Computer Experiences were also examined individually to determine where changes occurred. Three of the types of computers (Apple, Commodore and mainframe terminal) showed strong changes from pretest to posttest. Of the 69 clients who had not used the mainframe terminals, 23 (33%) used them during the program. Of the 84 clients who had not used an Apple computer, 20 (24%) used them during the program. Finally, of the 120 clients who had not used a Commodore computer, 12 (10%) used one during the program. Because the IBM-PC computers and the Library computers were introduced during the Computerphobia Program not many students used them at all (IBM: 3.6%; Library: 1%). One final note on computer use concerns an option on the pretest questionnaire. At the end of the list of computers on campus, clients could check "I didn't know that any of these existed." On the pretest, 13% of the clients checked this while on the posttest only 4% checked this, showing an improvement in knowledge and options among those who had the least knowledge.

Anxiety Reactions and Negative Cognitions were also examined for change in individual items. Table 19 displays the percentage of clients who checked each of the seven Anxiety Reactions and eight Negative Cognitions. It is clear that each checklist item showed a significant decrease in the percentage of clients who either indicated that they felt a certain type of discomfort or indicated that they

made negative internal self-statements. For the Anxiety Reactions the largest changes came from "restlessness" and "mind goes blank" which are two signs of discomfort that could be expected to make it difficult for a computerphobic to concentrate on her computer work.

For the negative cognitions, every statement showed a sharp decrease in the percentage of clients that checked the item suggesting that changes in cognitions occurred equally across the board.

Table 19

Percentage of Clients Who Checked Anxiety Reactions and Negative Cognitions on Pretest and Posttest.

Item	Pretest Percent	Posttest Percent	z-Score
ANXIETY REACTIONS:			
Sweaty Palms	21%	1%	5.26 ***
Queasy Stomach	11%	4%	2.38 **
Restlessness	38%	10%	5.66 ***
Heart Races	17%	6%	2.87 **
Mind Blank	38%	7%	6.20 ***
Shortness Breath	4%	1%	1.90 *
Light Headedness	5%	1%	1.71 *
NEGATIVE COGNITIONS:			
Cold-Impersonal	20%	5%	4.02 ***
Feel Stupid	27%	2%	5.96 ***
Never Able To Do	37%	2%	6.85 ***
Scared Make Mistake	55%	14%	7.42 ***
Feel Overwhelmed	28%	3%	5.92 ***
How Get Out?	29%	8%	4.42 ***
Everyone Else Knows	56%	12%	7.88 ***
Totally Confused	41%	3%	7.78 ***

Subjective Changes

Several items on the posttest questionnaire requested more open-ended, subjective assessment of change. One question asked: "What did you gain from this program?" Responses were grouped into categories with the following results. Only 2% of the sample could not think of anything that they gained, although another 2% felt that they only gained class credit. Nearly half (44%) felt they gained self-confidence, followed by information on computers (28%), better attitudes (25%), less fear/less anxiety (23%), thinking techniques (11%) and relaxation techniques (7%). (NOTE: these numbers total more than 100% because some clients listed more than one area in which they gained.)

Clients were also asked how they have used the skills that they learned in their personal life, academic life and career or job. Although responses varied widely, some trends were clear. Over half (51%) of the clients did not list any uses in their personal life and/or academic life. Over one-fourth (27%) used the skills to overcome other fears and other (non-computer related) negative thoughts while 15% used the skills in their interpersonal relationships and 8% used them in their own personal development. In terms of school-related uses, 28% used the skills to relax for examinations and 15% used them for help in studying.

Finally, although most students did not have a career or full-time job, 10% used the skills for career development, 11% used them for increasing confidence and another 7% used them for improving interpersonal skills with clients or customers.

The interns were also asked questions about their perceptions of the client. First, they were asked their rating of the client's improvement with 50% rating the client as much improved, another 36% as improved, 8% as slightly improved, 5% as no change and only 1% as much worse. In addition, interns were asked to list areas that the client reported to them that they used the skills. Responses were grouped into five categories - personal growth, more awareness of computers, school changes, job changes and miscellaneous. Over one-fifth of the time (22%) the intern left this question blank indicating no generalization of the skills. From the remaining subjects, 70% claimed personal growth, 33% school changes, 19% more awareness of computers, 14% job changes and 6% miscellaneous changes (including 2 clients who purchased a new computer because of the program). These percentages total more than 100% because some interns listed more than one area of generalization.

Group Differences

In Chapter 1, the five groups of subjects, Systematic Desensitization only (N=15), Thought Stopping/Covert

Assertion only (N=41), Information/Support Group Only (N=76), Systematic Desensitization plus I/S Group (N=7), and Thought Stopping plus I/S Group (N=10) were compared on all demographic and pretest variables. Demographically, the groups were similar in gender, age, major, class level and ethnic background with a slight difference in counseling history (more Systematic Desensitization clients had previous counseling or therapy). The groups differed on all pretest variables, as might be expected since the pretest was used in treatment assignment. The Systematic Desensitization clients had more computer anxiety than the Thought Stopping clients who had more computer anxiety than the I/S Group Only clients. Thought Stopping clients had more negative thoughts than the Systematic Desensitization clients who had more negative thoughts than the I/S Group Only clients. In terms of self-ratings I/S Group Only clients felt more knowledgeable, were less anxious, had more positive attitudes, were more confident and had few anxiety reactions of stress than all other groups. The I/S Group Only clients also had fewer negative thoughts than the Thought Stopping clients. None of the groups differed in computer utilization and campus computer use.

In order to determine change, the five groups were compared on their posttest scores to determine if any differences still exist between groups after the completion of treatment. The Analyses of Variance results are

displayed in Table 20. As is clear, there are only two significant differences between groups on the posttest measures. Using Duncan's New Multiple Range Test, the significant difference for the CTS indicates that Thought Stopping plus I/S Group had significantly more negative thoughts than the I/S Group Only, TS only or SD only. In terms of campus computer uses, the I/S Group Only clients used significantly more campus computers than either TS or TS plus I/S Group.

Thus, although the groups start at very different levels of various aspects of computerphobia, they appear to all complete the program at the same, low level of computerphobia. The average scores on the computerphobia measures are in the nonanxious, positive attitudes, and positive cognitions ranges (Rosen, Sears & Weil 1985). Self-ratings indicate that the clients rate themselves as moderately knowledgeable with positive attitudes, low anxiety and high confidence. these clients show few, if any anxiety reactions or negative cognitions, have used most computer applications 3-5 times and have used an average of one campus computing system. Overall, it appears that although the clients may all enter the program as "different" types of computerphobics, they leave the program as a uniformly "noncomputerphobic."

Table 20

Analyses of Variance for Posttest Scores.

Computerphobia Measure	Posttest Mean SD	TS	GRP	SD+G	TS+G	F-score
COMPUTERPHOBIA SCALES:						
CARS	79	76	76	79	83	0.21
CTS	117	117	118	114	106	2.79 *
ATCS	91	90	93	98	90	1.87
SELF-RATINGS:						
Knowledge	3.1	2.9	3.3	3.6	2.9	2.08
Attitude	4.2	4.1	4.2	4.3	3.8	1.24
Anxiety	1.9	2.2	1.9	2.1	2.3	0.76
Confidence	3.6	3.6	3.8	4.3	3.4	1.48
CHECKLISTS:						
Anx Reactions	0.2	0.4	0.2	0.3	0.7	1.62
Neg Cognitions	0.6	0.4	0.5	0.6	0.9	0.76
COMPUTER EXPERIENCES:						
Gen Comp Exps	2.6	2.6	2.9	2.4	2.5	2.41
Campus Comp Exp	1.3	1.0	1.5	1.1	0.7	3.24 *
Computer Owner	43%	28%	25%	0%	22%	X^2 =4.62

* $p<.05$

Note. TS=Thought Stopping/Covert Assertion (TS/CA);
SD=Systematic Desensitization;
TS+G=TS/CA plus Information/Support Group;
SD+G=SD plus Information/Support Group;
GRP=Information/Support Group.

Systematic Desensitization vs. Thought Stopping/Covert Assertion

The fact that some clients chose to complete both an individual and a group program makes it possible to examine their joint effect. Table 21 displays the 2 x 2 Analyses of Variance for each computerphobia posttest measure. This table shows that there was no interaction between the treatment type and the number of treatments in determining the posttest scores. The only significant effect indicated that clients who had taken both and individual treatment and a group had a significantly higher posttest CTS score (more positive cognitions) than clients who had taken an individual treatment alone. Although the interaction was not significant, this difference was more obvious for the Thought Stopping clients (individual alone mean CTS=117; individual plus group mean=106) than for the Systematic Desensitization clients (individual alone mean=117; individual plus group mean=114). The interaction was not significant due to the small sample sizes in the two dual treatment cells.

Overall, it appears that whether the client received an individual treatment or an individual treatment plus a group treatment had little or not effect on the final posttest scores. All clients completed the program with extremely little computerphobia.

Table 21

Two-Way Analysis of Variance F-Scores for Individual Treatment Type (SD vs. TS/CA) and Number of Treatments (Individual Only vs. Individual Plus I/S Group).

Computerphobia Measure	Main Effects		Interaction
	Treat Type (T)	Number of Treats(N)	T X N
COMPUTERPHOBIA SCALES:			
CARS	0.05	0.58	0.50
CTS	0.38	5.92 *	1.06
ATCS	1.88	1.36	2.47
SELF-RATINGS:			
Knowledge	2.69	0.78	1.79
Attitude	1.74	0.84	1.08
Anxiety	0.94	0.35	0.02
Confidence	1.60	0.52	2.00
CHECKLISTS:			
Anxiety Reactions	2.00	1.45	0.39
Neg. Cognitions	0.09	2.49	1.58
COMPUTER EXPERIENCES:			
Gen Comp Exps	0.01	0.27	0.02
Campus Comp Exps	2.47	1.22	0.16

*p<.05

Posttest Correlates

Table 22 examines the posttest correlate of each computerphobia measure with several variables of interest including number of sessions, intern rating and age. As can be seen, the intern rating only correlates with the frequency of use of various computer applications with higher ratings associated with more use.

Each client in an individual treatment had an "individualized" program. In general, ten sessions were planned for each client, however, some clients required more sessions and many clients required fewer. Overall, the average client required nearly 8 sessions. In addition, Systematic Desensitization required significantly more sessions (M=9.6) than Thoughts Stopping [M=7.4; $F(1,72)=40.94$, $p<.0001$]. With this in mind, Table 22 shows that number of individual sessions is correlated only with the CARS score and the number of Anxiety Reactions with lower attendance (fewer sessions) associated with more computer anxiety and more Anxiety Reactions. When viewed separately for each group, it appears that these correlational relationships only hold for the Thought Stopping/Covert Assertion treatment and not for the Systematic Desensitization treatment.

Finally, since nearly all clients (98%) completed five group sessions there was no correlation between number of group sessions completed and posttest results.

Overall, this analysis suggests that the posttest results are only minimally affected by attendance with all clients showing similar results, regardless of attendance.

The far right column of Table 22 displays the correlation of age and all posttest scores. Interestingly, age is positively correlated with the CARS, indicating that older clients completed the program with more computer anxiety than younger clients. Further, computer experience, both General and Campus Computer Experiences were strongly correlated with age. Further analysis of individual items indicated that older clients were less likely to use computers for class requirements or homework assignments; to learn programming languages; to play video games or computer games; to use the campus computer terminals and Apple computers. This result that older clients made less use of computers, particularly computers related to university instruction, is troubling as it shows a strong "age-gap" exists even after treatment.

Table 22

Correlates of Posttest Scores and Number of Sessions, Age and Intern Rating.

Computerphobia Measure	Intern Rating	Num Ind Session	Num Grp Session	Age
COMPUTERPHOBIA SCALES:				
CARS	-.10	-.19 *	.03	.15 *
CTS	.05	.04	.08	-.05
ATCS	.02	.12	.14	-.10
SELF-RATINGS:				
Knowledge	.08	.08	.03	-.10
Attitude	.12	.15	.11	.06
Anxiety	.07	-.04	-.08	.10
Confidence	-.06	.11	.08	-.04
CHECKLISTS:				
Anxiety Reactions	.02	-.21 *	.13	.02
Neg. Cognitions	.04	-.06	.07	-.02
COMPUTER EXPERIENCES:				
General Comp Exp	.28 ***	.00	.17	-.36 ***
Campus Comp Exp	-.13	.12	.03	-.27 ***

*p<.05 **p<.01 ***p<.001

Given the lack of pretest demographic differences, an analysis was performed to determine if any demographic characteristic was related to posttest performance. First, males and females did not differ significantly on any posttest measure. Second, clients from different ethnic groups differed on self-rated computer knowledge and computer experiences with Asian students having higher rated knowledge and more Campus Computer Experiences than Hispanic, White and Black students. In addition, White and Asian students had more General Computer Experiences than Black students.

Third, although there were no posttest differences between clients at various academic levels there was one expected difference between clients by academic major. Science majors used more campus computing facilities than Humanities, Education and Social Science students.

In-Class Screening

Over four semesters, 1,617 students in 76 classes received an In-Class Screening packet and a personalized Computer Comfort Profile. Of these, 102 participated in at least one computerphobia treatment. Each semester, where possible, the course instructor provided grades for each student. In all, grades were provided for 1,298 (80%) of the students. Of those who did not provide grades, 266 (16%) were in ungraded Education courses and the remainder

(N=53; 4%) were in courses where the instructor would not release the grades.

Based on the screening, students were divided into two groups, "At-Risk" and "Not At-Risk". Any student who was "at-risk" on either the CARS or the CTS was considered "At-Risk". Within each of these groups, the students were further divided into Treatment (one or more computerphobia treatments completed) or No Treatment (no computerphobia treatment completed). Table 23 presents performance data for these four groups including Failure Rate (including withdrawals; F, D or C- grades; or no credit grade); Dropout Rate (including withdrawals) and Course Grade (includes only those students receiving letter grades).

The data in Table 23 show several clear trends. First, when students were "At-Risk" and they chose to complete a treatment program they had significantly less chance of failure and dropout and significantly higher course performance. Their failure rate and dropout rate were reduced by half while the course grades (of those who obtained a final grade) improved nearly one-third of a grade. This can be viewed as an average improvement in one full letter grade for every three students. The "Not At-Risk" group also improved its dropout rate by three-fourths but did not significantly improve its failure rate although it did show 52% fewer failures (although this is probably due to the small sample size for "Not

At-Risk"/"Treatment" [N=39]). Course performance was also unchanged.

A second trend seen in Table 23 concerns the absolute levels of failure and dropout. It is striking that 31% of the "At-Risk"/"No Treatment" failed their course and that 24% withdrew from the courses. These figures are both quite high when compared to the university norm of 5%-10% although not surprising since these courses were those using computers and were probably more "threatening" than the typical university course.

Table 23

Failure Rate, Dropout Rate and Course Grades for "At-Risk" and "Not At-Risk" Partitioned into "Treatment" and "No Treatment".

Group	Sample Size	Failure Rate	Dropout Rate	Course Grade
AT-RISK:				
Treatment	60	15%	12%	3.12
No Treatment	422	31%	24%	2.80
Significance Test		X^2 =5.49*	X^2 =4.40*	t=2.09*
NOT AT-RISK:				
Treatment	39	10%	5%	3.11
No Treatment	777	21%	18%	3.07
Significance Test		X^2 =2.57	X^2 =4.23*	t=0.22
ALL STUDENTS:				
Treatment	99	13%	9%	2.98
No Treatment	1119	24%	20%	3.12
Significance Test		X^2 =5.72*	X^2 =6.96**	t=1.23

*p <.05 ** p<.01

Comparison Study

Several years prior to the establishment of the Computerphobia Reduction Program a study was completed with 145 students in similar courses to those in this study. Each course required computer interaction and students were given an extensive pretest and posttest battery of questionnaires including some that were given in the present study (CARS, ATCS, self-rating of knowledge, and checklist of Anxiety Reactions). Other computerphobia measures had not been developed at the time of this study. The following presents the results from this comparison study. Additional information about the study may be found in Rosen, Sears and Weil (1987).

Demographically, students in this comparison study were somewhat younger (M=25 in the comparison study; M=29 in the evaluation study); similar in ethnic background, similar in gender distribution, more likely to be in their junior year (compared to the evaluation study where students were most likely to be in their senior year), and similar in terms of academic major. With these differences, it is clear that these data must be analyzed with caution about the similarity of the two study samples.

The top portion of Table 24 presents the pretest and posttest data for the 111 members (74%) of the comparison sample who completed pretests and posttests (the remainder dropped their course). The data in this table suggest that

without treatment, the students did not show any significant change in computer anxiety, computer attitudes or anxiety reactions. They did, however, show an expected improvement in computer knowledge. This was expected since they were taking a course using computers.

The comparison sample differed from the Computerphobia Reduction Program sample in one other important way. In the Computerphobia Reduction Program, 70% of the clients were "at-risk" for computerphobia with the other 30% showing no risk. In this comparison study, only 39% were "at-risk" and 61% were not. This means that the results in Table 24 are based mainly on students who are not computerphobic while those in the Computerphobia Reduction Program are based mainly on students who are computerphobic. The middle section of Table 24 presents data for a weighted comparison study sample that controls for this problem by weighting the data from students not at-risk and those at-risk to match the percentages of these groups in the Computerphobia Reduction Program. The results show that without treatment the students did, indeed, significantly reduce their computer anxiety, significantly improve their computer attitudes and significantly improve their computer knowledge while maintaining their anxiety reactions. The bottom section lists the comparable data from the Computerphobia Program (reprinted from Table 16). Several points need to be highlighted. First, the drop in computer anxiety by the

Computerphobia Reduction Program clients was 3.5 times the drop in computer anxiety for the comparison study students. Second, the Computerphobia Reduction Program clients showed over 6 times more improvement in computer attitudes and almost twice as much increase in self-rated computer knowledge. Finally, while the Computerphobia Reduction Program clients reduced their Anxiety Reactions the comparison study students actually increased theirs (although not significantly). It is important to note that these changes were made over five weeks for the Computerphobia Reduction Program clients compared to 10 weeks for the comparison study students.

One final note can be made about the comparison study students. A total of 43 students began the class "at-risk"; of these, 26 (60%) remained computerphobic after the class. This compares to only 19% of the Computerphobia Reduction Program clients. Further, of the 68 comparison study students who were not computerphobic, 12 (18%) became computerphobic after their class. This compares to only 7% of the Computerphobia Reduction Program clients.

Table 24

Pretest and Posttest Means and Statistical Tests For Total Comparison Study Sample and Modified Sample.

Measure	Pretest Mean	Posttest Mean	Significance Test
ENTIRE SAMPLE (N=111):			
CARS	96.98	92.79	t = 1.53
ATCS	87.52	87.30	t = 0.30
Knowledge	2.96	3.38	t =-3.68 ***
Anxiety Reactions	.47	.58	t =-1.30
MODIFIED SAMPLE (N=111):			
CARS	113.12	102.10	t = 3.92 ***
ATCS	84.60	86.07	t = 2.22 *
Knowledge	2.82	3.38	t = 5.51 ***
Anxiety Reactions	.65	.75	t = 1.26
COMPUTERPHOBIA REDUCTION PROGRAM (N=149):			
CARS	116.38	77.03	t = -12.12 ***
ATCS	82.33	91.82	t = 13.35 ***
Knowledge	2.29	3.14	t = 10.08 ***
Anxiety Reactions	1.35	.30	t = -9.12 ***

* p<.05 ** p<.01 *** p<.001

CHAPTER 4: LONG-TERM PROGRAM EFFECTS

Follow-up questionnaire packets, including the three computerphobia scales and a Follow-Up Questionnaire, were mailed to all clients six months after completion of their treatment. As mentioned in Chapter 1, measures were taken to obtain follow-up data from participants through continued mailings and phone contacts. This chapter describes (a) the sample obtained through this procedure, (b) comparison of that sample to the entire treated population, (c) an examination of the long-term program effects and (d) an examination of further self-reported program effects.

Sample Description

In all, 41 clients completed follow-up questionnaires representing 27% of the total treated population. These 41 clients completed 48 treatments (30% of all treatments) with seven clients completing an individual treatment plus a group treatment. Table 25 displays some relevant information concerning treatment type and treatment starting date. It is clear from this table that the sample obtained for the follow-up was not biased in favor of any treatment type (Chi Square=3.10, $p>.05$) or starting semester (Chi Square=9.45 ,$p>.05$).

Table 25

Comparison of Follow-Up Sample and Treatment Population on Treatment Type and Start Semester.

Comparison Information	Treatment Population	Follow-up Sample
TREATMENT TYPE:		
TS/CA	41 (28%)	11 (27%)
SD	15 (10%)	7 (17%)
I/S Group	76 (51%)	16 (39%)
TS/CA + I/S Group	10 (7%)	4 (10%)
SD + I/S Group	7 (5%)	3 (7%)
SEMESTER:		
Winter 1986	3 (2%)	2 (5%)
Spring 1986	10 (7%)	5 (12%)
Fall 1986	47 (32%)	13 (32%)
Spring 1987	22 (15%)	11 (27%)
Fall 1987	21 (14%)	6 (15%)
Spring 1988	38 (26%)	4 (10%)
Summer 1988	8 (5%)	a

[a] No follow-up data collected on Summer 1988 clients.

Comparison of Follow-Up Sample and Treated Population

Before making any conclusions about long-term effects, it is important to compare clients who completed the Follow-Up Questionnaire and clients who did not on all demographic, pretest and posttest information.

Demographically, clients who completed the follow-up were statistically identical to clients who did not complete the follow-up in age, gender, ethnic background, prior therapy, academic major and academic level.

These two groups also did not differ on any pretest variables except for a small significant difference on Campus Computer Experiences with the follow-up sample showing a mean of 1.3 uses and the non-follow-up sample showing a mean of 1 computer use [$t(147)=1.94$, $p<.05$]. However, on the posttest, no differences were found on any variables.

Overall, the follow-up sample can be considered to not differ from the entire client population allowing valid long-term analyses of changes.

Long-Term Program Effects

Table 26 shows posttest and follow-up means for all program variables. Four points are worth noting. First, most scales maintained the strong gains that they made from pretest to posttest. Table 27 provides further detail on changes in Anxiety Reactions and Negative Cognitions. It is clear from this table that Anxiety Reactions remain absent

with the exception of "restlessness" which is evident in nearly the same percentage of clients as it was at the posttest (22% vs. 17%). The Negative Cognitions all remain absent with the exception of the desire to "get out of the situation" (17%) and being "totally confused" (10%) which are still checked by a few clients. One point of note is that being "scared that I'll make a mistake" continued to decrease from 63% at the pretest to 13% at the posttest and to only 7% at the follow-up.

Although there is no change in computer ownership, there was an indication that the clients would purchase a computer in the future. When asked if they planned to buy a computer in the future 3% said they planned to purchase one in the next 6 months, 13% in the next 12 months and another 56% in the next 5 years. Of the 10 clients who owned a computer, 5 stated that they used their computer "more" or "much more" than before the program, 3 stated that they used it the same amount of time as before the program and only 2 used it "less" or "much less" than before the program.

Second, the ATCS showed a significant change in the negative direction (more negative attitudes). This result is difficult to reconcile with the lack of change in the self-rated attitude. However, it should be noted that the ATCS mean was still, at follow-up, significantly higher than the pretest mean, indicating that the clients still had more positive attitudes than they had at the pretest.

Third, on the average, clients showed a positive change in self-rated computer knowledge showing continued technological growth. This result is supported by the fact that 42% (N=17) of the clients indicated that they had taken a course that used computers in the six months since competing the program. In fact, of these 17 clients, 6 had taken 2 courses in the six months!

Finally, the General Computer Experiences question was phrased differently on the follow-up in that it asked for uses in the last 6 months as compared to the pretest and posttest which simply asked for computer uses. However, it is interesting to note that on the average, clients used each of the computer applications 1-2 times during just six months where they had used the applications 1-2 times in their entire life prior to this study. Table 28 expands on this result by indicating the percentage of clients who had participated in a range of computer-related activities during the six months and who planned to participate in those activities in the future. Nearly half or more than half of the clients made use of the computer for homework assignments, used the computer terminals on campus and used the library terminals. In terms of future plans, for 11 of the 17 activities, clients showed increased planned utilization with strong plans to learn programming languages, take a word processing class and use computer study aids, use other computer terminals. Clients planned

to continue to use the computer to do homework assignments and to use the library terminal. Finally, a sizable change was seen in the percentage of students who had not used the PLATO system but planned to do so.

An additional series of questions asked if the client had used a personal computer in "any ways you had not used one before?". The most common "new uses" of computers included: word processing (24%), creating data bases (17%), computer filing systems (15%), computer games and using a modem (12% each) and skill development (10%).

Table 26

Posttest and Follow-up Scores and Statistical Tests for Computerphobia Measures.

Computerphobia Measure	Posttest Score	Follow-up Score	Significance Test
COMPUTERPHOBIA SCALES:			
CARS	79.59	81.95	t = 0.54
CTS	117.80	115.48	t = 1.32
ATCS	91.32	88.05	t = 2.74 **
SELF-RATINGS:			
Knowledge	3.13	3.37	t = 1.94 *
Attitude	4.08	3.92	t = 1.23
Anxiety	1.92	1.84	t = 0.62
Confidence	3.74	3.68	t = 0.27
CHECKLISTS:			
Anxiety Reactions	.32	.34	t = -0.27
Negative Cognitions	.37	.32	t = 0.44
COMPUTER EXPERIENCES:			
General Comp Exp	2.79	2.19	t = 6.84 ***
Computer Ownership	32%	34%	z = 0.22

* p<.05 ** p<.01 *** p<.001

Table 27

Percentage of Follow-Up Sample Clients Who Checked Anxiety Reactions and Negative Cognitions on Pretest, Posttest and Follow-Up.

Item	Pretest Percent	Posttest Percent	Follow-Up Percent
ANXIETY REACTIONS:			
Sweaty Palms	14%	2%	0%
Queasy Stomach	20%	5%	5%
Restlessness	41%	17%	22%
Heart Races	20%	2%	0%
Mind Blank	34%	2%	5%
Shortness Breath	2%	0%	0%
Light Headedness	5%	0%	0%
NEGATIVE COGNITIONS:			
Cold-Impersonal	26%	5%	5%
Feel Stupid	26%	3%	5%
Never Able To Do	40%	3%	5%
Scared Make Mistake	63%	13%	7%
Feel Overwhelmed	31%	8%	2%
How Get Out?	23%	3%	17%
Everyone Else Knows	57%	3%	7%
Totally Confused	51%	0%	10%

Table 28

Percentage of Follow-Up Sample Who Participated in Computer-Related Activities in Six Months Between Pretest and Posttest and Planned to Participate in Future.

Activity	Six-Months	Future
Programming Language Class	3%	44%
Word Processing Class	15%	39%
Computer Art Class	0%	10%
Computer Music Class	0%	5%
Homework on Computer	56%	51%
Exams on Computer	12%	20%
Study Aids on Computer	17%	44%
Classes on Computer	7%	17%
PLATO Self-Teaching Computer	5%	24%
CSUDH Computer Terminal	42%	37%
Other Computer Terminal	22%	39%
CSUDH Apple Lab	17%	20%
CSUDH Commodore Lab	17%	15%
CSUDH Library Terminal	42%	37%
CSUDH Leading Edge Lab	20%	15%
SIGI Career Guidance System	22%	15%
Learning Assistance Center	10%	22%

Additional Long-Term Effects

On the Follow-Up Questionnaire clients were asked to check a list of "cognitions" that included the same negative cognitions as in the pretest and posttest questionnaires plus seven positive cognitions that did not appear on the earlier questionnaires. Table 29 displays the percentage of clients checking each of these positive cognitions in order from most to least. The data in this table show that most clients were willing to try using computers and were confident that they could use the computer if others could. Half felt that they could get help if stuck and felt that it would be fun and that they could "do it". The least agreement was to the statement "I'm excited" which may be because being excited has a negative connotation for some and a positive connotation for others.

Table 29

Percentage of Follow-Up Sample Clients Who Checked Positive Cognitions.

Positive Cognition	Percentage of Clients
I am willing to give it a try	80%
Others have learned this and so can I	71%
This will be fun	59%
I can get help if I get stuck	59%
I know I can do it	51%
This is really interesting	39%
I'm excited	20%

Clients were also asked about computer use in their professional life. Of the 32 clients who were employed, 7 (22%) had used computers for the first time and 11 (34%) had used computers in new ways (other than their earlier use). Perhaps most interesting were the answers to the question "Which of the following best summarizes your career aspirations at this time?" which had the following responses (with three responses left blank):

> "I would definitely consider a career that involves computer use in some way" [N=14; 34%]
>
> "I would consider a career that involves computer use in some way." [N=10; 24%]
>
> "I would be reluctant to pursue a career that involves computer use" [N=2; 5%]
>
> "Computer use would not be a factor in selecting a career" [N=12; 29%]

Overall, over half the sample were extremely positive about using computers in their career while only 5% were reluctant.

Clients were also asked to indicate which skills they learned in the program and to rate the helpfulness of those skills in dealing with computers. Table 30 displays those results which indicate that nearly all clients found their skills either extremely helpful or moderately helpful.

In addition, clients were asked to rate the overall effectiveness of the program on several dimensions. These data are summarized in Table 31. As is evident, the

majority of clients felt that the programs were either effective or very effective in reducing anxiety (96%), improving attitudes (86%), and increasing use (76%). For the Information/Support Group clients over three-fourths felt that the groups reduced their fears, clarified what computers can do and made them more comfortable around computers. An additional 65% felt that the program helped them clarify their goals.

Table 30

Skills Learned by the Follow-up Sample and Rated Helpfulness of each Skill.

Skill	Extremely Helpful	Moderate Helpful	Slightly Helpful	Not Helpful
More Relaxed	51%	31%	14%	3%
Stop Neg Thoughts	57%	30%	8%	3%
Replace Neg Thoughts	50%	39%	8%	3%
Relax in Anxious Situations	49%	38%	11%	3%

Table 31

Rating of Effectiveness of Treatment Program on Several Dimensions.

Dimension	VE	E	Neutral	I	VI
ALL FOLLOW-UP CLIENTS:					
Decrease Anxiety	42%	54%	2%	0%	2%
Improve Attitude	42%	44%	12%	2%	0%
Increase Use	42%	34%	22%	2%	0%
INFORMATION/SUPPORT GROUP CLIENTS ONLY:					
Reduce Fears	26%	52%	13%	9%	0%
Clarify What Computers Can Do	30%	48%	13%	9%	0%
Help Set Future Goals	26%	39%	26%	9%	0%
Increase Comfort	30%	48%	13%	9%	0%

Note. VE=Very Effective; E=Effective; I=Ineffective; VI=Very Ineffective

Finally , the Follow-Up Questionnaire also asked the clients to check which of a list of statements described their feelings about making their personalized graduation certificates (the final part of each treatment program). Two of the statements expressed positive feelings ("fun"; "rewarding"), one expressed a negative feeling ("made me uncomfortable") while two others expressed feelings about future and current usefulness ("made me want to use computers more"; "of no real value"). Overall, 78% of the clients thought that the graduation certificate was "fun" while 42% thought that it was "rewarding" and only 7% felt that it made them "uncomfortable." In terms of usefulness, the data showed that only 20% felt that it "made me want to use computers more" while 12% felt that it was of "no real value." Thus, this graduation certificate appeared to be enjoyable, but not seen as very valuable.

CHAPTER 5: COMPARISON OF CLIENTS, DROPOUTS AND NONSTARTERS

In addition to pretreatment analyses of clients who completed the Computerphobia Reduction Program, it was deemed important to examine two other subgroups - program Dropouts and Nonstarters. A Dropout is defined as a "client" who was pretested, assigned to a treatment, began treatment, but did not complete the program. A Nonstarter is defined as a "client" who was pretested, expressed interest in participating in a treatment program, but who never actually received any treatment.

Comparison of Clients, Dropouts and Nonstarters may provide insight into ways the program can be modified to better meet the needs of our client population.

As discussed above, 149 clients completed at least one of five possible treatment combinations. Twelve "clients" dropped out, and 40 "clients" were classified as Nonstarters. As in previous analyses, differences on demographic, objective and self-report measures were examined.

Demographic Variables

The analyses revealed no significant gender, academic major or prior therapy differences (see Table 32). However, there were significant differences between the three groups on academic level, ethnicity and age.

The academic level analysis appears to indicate that Dropouts are more likely to be upper classmen: 20% of Clients were juniors and 45% were seniors while nearly all of the Dropouts (89%) were juniors or seniors.

Data on ethnicity indicated that Nonstarters were more likely to be Black or White then Asian or Hispanic. Dropouts were more likely to be White.

There were significant age differences between the three groups. Completers were significantly younger than both Nonstarters and Dropouts.

Computerphobia Scales

All of the computerphobia scales (CARS, ACTS, and CTS) revealed significant differences between the groups as seen in Table 33. Dropouts had higher anxiety than both Nonstarters or Clients. Nonstarters had both more positive attitudes, and more positive cognitions than Dropouts or Clients.

Self-Report Measures

On the self-report measures, no significant differences between groups were found on self-rated knowledge of computers, type of computer uses and campus computer uses.

However, on the other measures, interesting differences were found. For the most part Nonstarters seemed to stand apart from the other two groups. On self-reported levels of anxiety, Nonstarters had less anxiety than either Clients or Dropouts. Along the same lines, Nonstarters reported fewer

anxiety reactions and negative cognitions than Clients or Dropouts. Clients and Nonstarters were not different from each other, but were both significantly more positive than Dropouts on self-measures of attitude and confidence.

Table 32

Comparison of Clients, Dropouts and Non-starters on Demographic Variables.

Demographic Variable	Clients (N=149)	Dropouts (N=12)	Nonstarters (N=40)	Statistical Test
GENDER:				
Male	31%	25%	32%	X^2
Female	69%	75%	68%	X^2 =0.24
ACADEMIC LEVEL:				
Freshmen	11%	0%	see	
Sophomores	21%	11%	note	
Juniors	20%	22%	below	
Seniors	45%	67%		X^2
Grad Students	4%	0%		X^2 =37.67***
ACADEMIC MAJOR:				
Social Sciences	23%	36%	32%	
Humanities	4%	0%	5%	
Science-Math	6%	9%	5%	
Management	48%	36%	45%	
Education	12%	18%	5%	X^2
Other	6%	0%	8%	X^2 = 5.14
PRIOR THERAPY	20%	42%	10%	X^2 =5.91
ETHNICITY				
Asian	19%	10%	5%	
Black	35%	20%	37%	
Hispanic	16%	0%	8%	X^2
White	30%	70%	50%	X^2 =14.42*
AGE (Mean)	28.7	37.3	32.6	F=4.98**

*p <.05 ** p<.01 *** p<.001

Note. No data available for class standing for this group.

Table 33

Comparisons of Clients, Dropouts and Nonstarters on Computerphobia Scales, Self-Report Measures, Checklists and Computer Experiences.

Measure	Completers (N=149)	Dropouts (N=12)	Nonstarters (N=40)	F-Test
COMPUTERPHOBIA SCALES:				
CARS	116.38	144.92	108.72	3.81*
ATCS	82.33	77.50	88.72	10.56***
CTS	95.63	85.46	103.10	3.99*
SELF-RATINGS:				
Knowledge	2.32	2.42	2.45	0.39
Attitude	3.01	2.33	3.34	4.80**
Anxiety	3.07	3.58	2.63	4.36*
Confidence	2.59	2.08	2.89	3.41*
CHECKLISTS:				
Anxiety Reactions	1.34	1.50	0.63	5.06**
Negative Cognitions	2.84	3.67	1.71	5.56**
COMPUTER EXPERIENCES:				
General Comp Exps	2.29	2.15	2.54	2.57
Campus Computer Exp	1.11	0.67	1.03	1.55

*p <.05 ** p<.01 *** p<.001

CHAPTER 6: SUMMARY AND IMPLICATIONS

The goal of this research program was to develop and test a "Model Computerphobia Reduction Program." The development of the program is detailed in Weil, Rosen and Shaw (1988) including all aspects of the student outreach, faculty development and program dissemination. This report has presented evidence about the success of this development effort.

Summary

By all standards the Model Computerphobia Reduction Program was a strong success. Over two years of operation 204 potential clients approached the program with 79% choosing to begin participation. Of these, 92% completed the program! In all, 149 clients received 166 treatment modules with 17 clients receiving two treatment modules each.

Based on initial classroom screening and extensive pretesting, clients were assigned to one or two of the three treatment modules: Systematic Desensitization, Thought Stopping/Covert Assertion and Information/Support Group. Over half of the clients (76) completed an Information/Support Group Only with the remainder completing either an individual treatment module (Systematic Desensitization N=15; Thought Stopping/Covert Assertion N=41) or an individual module plus the Information/Support

Group (Systematic Desensitization plus the Group N=7; Thought Stopping/Covert Assertion plus the Group N=10).

Although clients represented all demographic characteristics of this nontraditional urban university, a typical client could be described as a female senior majoring in the School of Management with no prior history of psychotherapy. This client entered the Computerphobia Reduction Program with lower than average computer knowledge, moderate computer anxiety and low confidence in her ability to use computers. She exhibited symptoms of psychological anxiety disorders including restlessness, wandering mind, sweaty palms and racing heart when she attempted to interact with a computer. She also felt scared that she would make mistakes, felt totally confused about computers, felt that other people knew what she didn't know and felt hopeless, helpless and ignorant when interacting with computers. She had little computer experience (e.g., word processing, computer programming) although she was likely to have had some experience with "passive" computing including automatic bank teller machines and computerized games.

Clients showed dramatic changes following their short (5 week) program. Nearly all clients showed markedly decreased anxiety, improved cognitions and enhanced attitudes as measured by both the computerphobia scales and the self-report measures. The typical client began the

program "at-risk" for computerphobia in at least one area (anxiety, cognitions, attitudes) and completed the program by showing no risk in any area. Clients completed the program with few, if any, anxiety reactions and negative cognitions. On the positive side, clients increased computer utilization on campus, in their personal life and in their job.

The five groups (the two individual treatments, the group treatment, and the two individual treatments coupled with the group treatment) were compared on all measures both before and after the program. Before the program there were strong, expected differences between groups with clients in individual treatments showing more computerphobia than clients in group treatments. After the program, however, all five groups showed equivalent scores on nearly all measures. In essence, clients entered the specific program with varying amounts and types of computerphobia and completed their program uniformly noncomputerphobic!

The results of two other studies were examined to add further support for the program results. As part of the screening, 1,617 students completed two computerphobia measures and were presented with graphic feedback depicting their level of computerphobia. Those students who were judged to be "at-risk" were divided into two groups, students who sought treatment from the Computerphobia Reduction Program and students who chose not to participate

in the program. A comparison of final course grades revealed that the Computerphobia Reduction Program participants showed a 50% reduction in dropout and failure rate and a significant increase in course graded performance.

A second study compared 145 students before and after a ten-week course using computers. Comparing results from the present study, the Computerphobia Reduction Program participants showed a 3.5 times larger reduction in computer anxiety, a 6 times larger increase in computer attitudes and twice as large an increase in self-rated computer knowledge in only five weeks. While the comparison study students actually showed an increase in anxiety reactions, the Computerphobia Reduction Program clients showed a marked decrease in these potentially debilitating responses to the computer.

A sub-group of 41 clients responded to a six-month follow-up questionnaire to assess long-term changes. In all respects, these 41 students were identical to the entire client population, so the results may be assumed to represent the study sample. After six months the clients showed that they maintained the gains that they had demonstrated immediately after program completion. They continued to show low levels of computer anxiety, positive computer attitudes, positive computer cognitions, few anxiety reactions and high self-confidence in computer

interactions. In addition, they showed a strong increase in self-rated computer knowledge, perhaps due to an increase in computer utilization in their personal life and their academic career. These students actively sought out computer experiences that were, at best, frightening and avoidable before the program. Perhaps the most telling statistic is that over 50% would now consider a career involving computers.

One final analysis was performed to determine any characteristics that defined the students who took the pretest measures, but chose not to participate in the program (called Nonstarters) and the clients who withdrew their participation before completing the program (called Dropouts). The dropouts were consistently seen as having substantially more computer anxiety, more negative computer attitudes and more negative computer cognitions than either the clients or the Nonstarters. In contrast, the Nonstarters, as a group, had more positive attitudes, more positive cognitions, fewer anxiety reactions and were more confident than the program clients.

The best summary of our results comes from a "motto" that we placed on our appointment cards (to remind clients of their next appointment day and time):

"Combat negative thoughts, eliminate self-doubts, reduce anxiety - increase your confidence around computers"

Implications

The major implication of this project is that the Model Computerphobia Reduction Program successfully changed nearly 150 people from being computerphobic to seeking further positive computer experiences. All objective and subjective measurements indicated that program participants showed impressive changes after their five-week program and continued to demonstrate those changes over a six-month time span.

Perhaps the most interesting result is that regardless of the initial level and type of computerphobia, all clients completed their program with the same low anxiety, positive attitudes and positive cognitions. This validates the findings of Heinssen (1987) who found that matching a computerphobic client's presenting problem (cognitive or somatic) to a treatment type (cognitive restructuring or applied relaxation) did not yield additional benefits. This suggests that the optimal strategy for reaching the largest number of computerphobics in the most cost-effective manner might be to develop a group program that incorporates aspects of all three of our treatment programs. The fact that our results showed that an individual treatment yielded similar benefits as an individual treatment plus a group treatment provides corroboration for this strategy. In addition, the fact that Heinssen (1987) provided his treatment to small groups, suggests that a group format may

successfully assist a range of computerphobic presenting problems.

All clients, male or female, young or old, Black, White, Hispanic or Asian were helped by the Computerphobia Reduction Program. Regardless of academic level or academic major, program benefits were uniform. This suggests that the Computerphobia Reduction Program would be applicable to a wide range of people. As the literature has clearly demonstrated, there are computerphobic business people, computerphobic school teachers, computerphobic housewives. The current evaluation suggests that a program like the Computerphobia Reduction Program could assist all of these people become more comfortable with computers and computerized technology.

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